Space Weather Forecast

Issued on Sunday, 24 April 2022 at 13:26 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate Solar activity likely with further Moderate flares (R1/R2 Radio Blackouts) and a slight chance of strong flares (R3 Radio Blackouts).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low with only Common-class flares observed. There are eight sunspot regions on the disc, the largest and most prominent of these being in the northwest, one is arranged such that some north-south shear instability is likely. All other regions are smaller and simpler. Further spots have the potential to rotate onto the Earth-facing disc from around the southwest limb. No Earth-directed coronal mass ejections have been observed on available imagery during the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind speed as observed by DSCOVR and ACE at L1 has remained largely unchanged, oscillating between slightly elevated and elevated, this likely due to an ongoing transition into the coronal hole fast wind. The Interplanetary Magnetic Field strength persisted at weak levels, with the north-south component Bz oscillating between weakly positive and negative. Geomagnetic activity was Quiet to Active.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar Activity likely to increase to Moderate at times through the period, with further Moderate flares, most likely from the larger sunspots on the northwest disk. There is a slight chance of this increasing to High due to an isolated X-class flare.

Solar Wind / Geomagnetic Activity: A CME which left the Sun on the 21st due to a Moderate flare has a low chance to give a glancing interaction on day 1 (24th). Otherwise, slightly elevated or elevated solar winds day 1 (24th), due to the arrival of the fast wind from a coronal hole, are expected to gradually ease day 2 (25th) and beyond. A spell of Unsettled to Active geomagnetic activity is possible at first day 1 (24th), and again, with any CME arrival. There is a slight chance of G1/Minor Storms. Otherwise mainly Quiet conditions are expected, with isolated Unsettled spells.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to remain at background with no solar radiation storms occurring. The risk of solar radiation storms, although remaining very low, increases through the period as the complex sunspot regions on the Earth-facing disc move across the northwest disc. This is due to them moving into a position where any energetic particles that are released from any flares that occur are more likely to be observed at Earth.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	5	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	60	60	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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